

**A Synopsis of the Genus *Epanthidium* Moure with the  
Description of a New Species from Northeastern  
Mexico (Hymenoptera: Megachilidae)<sup>1</sup>**

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The genus *Epanthidium* consists of 12 described species from southern South America. Therefore, it was surprising to discover a 13th species from northeastern Mexico. Although amphitropical distribution is relatively uncommon in bees, it is not unknown even in the Anthidiini. For example, Michener and Ordway (1964) described a species of the anthidiine bee genus *Nananthidium* Moure from northeastern Mexico. This genus was previously known only from southern South America.

I have not seen all of the primary types (those seen are identified by an exclamation point after the depository) and for some species interpretations I have relied on the original descriptions and specimens identified by Schrottky, Friese and Moure. However, it must be pointed out that the original descriptions are based largely on color, which is often variable within species and also similar in different species, so that a few nomenclatorial corrections may be anticipated. I hope to treat the generic relationships of the New World genera of Anthidiini at a future date since data gathered after Michener's 1948 revision of the tribe suggest some different groupings.

I present here a key to the known species which should aid in future type and revisionary studies, and also to suggest the relationship of the new species described here. New records and floral associations gathered to date are also provided.

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COLLECTIONS STUDIED AND TYPE DEPOSITORIES

AMNH—American Museum of Natural History, New York 10024. J. G. Rozen, Jr.

<sup>1</sup> Contribution No. 549. Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, Florida.

- Berlin—Zoologisches Museum der Humboldt—Universität, East Berlin, Germany.
- BM—British Museum (Natural History), London, England. I. H. H. Yarrow.
- Curitiba—Department of Zoology, University of Paraná, Curitiba, Brasil. J. Moure.
- FSCA—Florida State Collection of Arthropods (Hymenoptera Collection), Gainesville, Florida 32602. H. V. Weems, Jr.
- Fritz Collection—Private collection. Instituto Entomológico de Salta, P.O. Box 3, Rosario de Lerma, Salta, Argentina. Manfredo Fritz.
- IML—Instituto Miguel Lillo, San Miguel de Tucumán, Argentina. A. Willink.
- KU—Snow Entomological Collection, University of Kansas, Lawrence, Kansas 66045. C. D. Michener.
- Logan—Bee Biology & Systematics Laboratory, Utah State University, Logan, Utah 94321. G. E. Bohart.
- LACM—Natural History Museum of Los Angeles County, Los Angeles, California 90007. R. R. Snelling.
- MLP—Museo de Ciencias Naturales, La Plata, Argentina. L. de Santis.
- Paris—Musée National d'Histoire Naturelle, Paris, France. S. Kellner-Pillault.
- Porter Collection—Private collection. 301 N. 39th Street, McAllen, Texas 78501.
- São Paulo—Departamento de Zoologia, Secretaria da Agricultura, São Paulo, Brasil.
- UCD—Entomology Museum, University of California, Davis, California 95616. R. M. Bohart.
- USNM—U.S. National Museum of Natural History, Washington, D.C. 20560. A. S. Menke.
- Vienna—Naturhistorisches Museum, Vienna, Austria. M. Fischer.

### *Epanthidium* Moure, 1947

Type species: *Hypanthidium tigrinum* Schrottky, by original designation.

This genus was reduced to subgeneric status (under *Dianthidium*) by Michener (1948), but its structural characters warrant generic status in my opinion. These include the absence of the preoccipital carina, male hindcoxa not spined, presence of upper propodeal pits at least laterally, modified metasomal sternum VI of the female and sternum II of the male, and the elevated lamella of the posterior lobe of the pronotum. Although little information on nesting habits is available, one nest I examined was made from adobe clay (5 cells), and no resin was used, which contrasts with the better known nests of *Dianthidium* (Grigarick and Stange, 1968) which have plant resins as the common bonding material. *Anthidium inerme* Friese, 1908, was included in the genus by Michener (1948) but my studies of the type material have convinced me that it is not congeneric and probably belongs to a new genus.

*Diagnosis.*—Body robust, mesoscutum broader than long; interalveolar carina absent; female mandible 4-toothed; maxillary palpus 2-segmented; preoccipital carina absent; arolium present; pronotal lobe lamellate, elevated, sometimes low and opaque; anterior and lateral faces of mesepisternum separated by a carina; propodeum with sulcus behind spiracle; row of pits along upper margin of propodeum strongly developed at least laterally; posterior coxa of male without spine (although a small tooth present in a few species); metasomal sternum VII of male

trilobed or bilobed; sternum II with a transverse elevation usually ending sublaterally in a spine; female sternum VI variously modified with processes or ridges.

***Epanthidium boharti* Stange, NEW SPECIES**  
(Figs. 1, 8, 11)

*Diagnosis.*—The bilobate metasomal tergum VII of the male (Fig. 1) is distinctive in the genus (other species are trilobate) except for *E. paraguayense* (Schrottky) from South America. These 2 species can be separated in the male by the deeper emargination of tergum VII in *E. boharti*. Female *E. boharti* can be distinguished from all other known species except *E. paraguayense* and *E. erythrocephalum* by the lack of a median carina on metasomal tergum VI. From these 2 species, female *E. boharti* can be distinguished by the sublateral tooth on sternum VI (from *erythrocephalum*) and the distance between the lateral ocellus and the posterior margin (from *paraguayense*). The black and ivory coloration in both sexes of *E. boharti* is distinctive from the South American species which usually have red or orange markings.

*Holotype male.*—Length 14 mm, forewing 10 mm; width of metasoma (at middle) 5 mm. Base color black with ivory markings as follows: clypeus except apex and dorsal margin to tentorial pit; paraocular stripe from clypeus to about level of antenna; small spot near dorsal margin of eye; anterior margin of mesoscutum interrupted widely at middle where it points posteriorly, and extending along lateral margin to near middle of tegula; axillae nearly completely; metanotum with large spot laterally interrupted medially by a triangular black area; metasomal tergum I with large sublateral spot extending nearly to middle, broadly emarginate posteriorly; following 3 terga with sublateral spots decreasing in size posteriorly; terga III-VI with transverse stripe at middle decreasing in length posteriorly; pubescence mostly whitish except for closing faces of tarsi which are golden color. Forewing uniformly dark infusate with violaceous reflection, except apical  $\frac{1}{4}$ .

Pubescence—Basitarsus of foreleg and midleg with many elongate setae on posterior margin, about 3 times as long as greatest width of tarsus.

Puncturation—Vertex posterior to ocelli shiny with setiferous punctures about one puncture apart. Tegula shagreened but nearly impunctate at middle; upper row of propodeal pits absent at middle; area anterad of sternum II ridge sparsely punctate.

Structure—Clypeal apex with 4 fairly evenly spaced teeth; scape shorter than pedicel and first 3 flagellomeres together; distance between lateral ocellus and hind margin greater than interocellar distance; height of posterior lobe of pronotum less than midocellus diameter, opaque; mesepisternum not produced ventrally into small tooth; midventral carina of mesosoma low throughout; tegula with posterior margin narrow, thin (as in Fig. 20); midcoxa without tooth at mesal posterior margin; curved ridge of sternum II strongly raised with strongly sloping posterior face, sublateral tooth moderately developed; tergum VII bilobate (Fig. 1); lateral margins of terga V-VI without teeth or tubercles; genitalia as in Fig. 8.

*Female.*—As described for male except as follows: clypeus black, vertex with posterior margin orange-colored; scopa whitish; foreleg and midleg without elongate setae on basitarsi; tegula densely punctured at middle; mandible quadri-

punctate; tergum VI without longitudinal carina and with subapical margin strongly angled laterally followed by undulating outline to sting emargination, without teeth; sternum VI with sublateral ridge produced into tooth sublaterally, medial process narrowly rounded (Fig. 11).

*Types*.—Holotype ♂: MEXICO, *Tamaulipas*: 55 km S. Ciudad Victoria, Ruta 85 ca. Llera, 22, 25-VI-1981, B. Miller, C. Porter, L. Stange (FSCA). Paratypes as follows: 2 ♀, same data as holotype (FSCA, Porter Collection). MEXICO: *Nuevo Leon*: Cola de Caballo, ca. El Cercado, 15–23-VI-1976, 2 ♀, C. Porter (FSCA, Porter Collection); *Tamaulipas*: Ruta 180, ca. Soto la Marina, 75 km E. Ciudad Victoria, 1-VII-1981, 1 ♀, B. Miller, C. Porter, L. Stange (FSCA).

*Etymology*.—This species is named for Richard M. Bohart in celebration of his seventieth year.

***Epanthidium anisitsi* (Schrottky)**

(Fig. 6)

*Dianthidium anisitsi* Schrottky, 1908:231. Syntypes, ♂, ♀, Asuncion, Paraguay, Anisits Collection (not located).

*Anthidium olympinum* Strand, 1910:546 (synonymy after Schrottky, 1920:211).

Three syntypes, ♂, Asuncion, Paraguay (Berlin).

Taxonomy: Moure, 1947:35 (in *Epanthidium*).

This is one of the largest species in the genus, with the spine of the curved ridge of the male sternum II unusually large and somewhat erect. Male tergum VII is distinctive in that the middle process is below the plane of the lateral process (Fig. 6). The female is unknown to me. I have not seen the types, but I have seen a specimen identified by Schrottky in 1910.

*New record*.—PARAGUAY: Cuagazu, XI-79, M. Fritz coll. (1 ♂—FSCA).

***Epanthidium autumnale* (Schrottky), NEW COMBINATION**

(Figs. 2, 9, 12)

*Dianthidium autumnale* Schrottky, 1909a:218. Holotype ♂, Paraguay, Puerto Ber-toni, 2-III-1909 (not located).

This species is, according to my records, commonest in arid northwestern Argentina. A few specimens seen from Brazil and Argentina (Misiones) have more extensive yellow bands on the metasomal terga. The male has a distinctive tergum VII with the emargination between the middle and lateral process very shallow (Fig. 2). The yellow spot on the male hindcoxa is distinctive except for *E. nigrescens* and *E. bicoloratum*.

*New records* (37 ♂, 24 ♀).—ARGENTINA: *Catamarca*: El Rodeo, IV, Porter (1 ♂, 1 ♀—FSCA); 20 km E. Belen, flowers of *Zuccagnia*, X, Stange (1 ♀—FSCA). *Salta*: Yacochuya, III–IV, Porter, Stange, Willink collectors (6 ♂, 17 ♀—IML, FSCA); Tacuñ, I, Stange, Willink collectors (1 ♀—FSCA); 5 km W. Agua Blanca, V, Stange (2 ♂—FSCA); Rio Pescado, IX, Porter (1 ♀—FSCA). *Tucuman*: San Pedro de Colalao, XI, Stange (2 ♂—FSCA); Tacanas, XI, XII, Stange (2 ♂—FSCA); Raco, I, Stange (1 ♂, 1 ♀—FSCA); Amaicha del Valle, I, Stange (1 ♀—FSCA). *Jujuy*: 7 mi. S. Volcan, III, Stange (1 ♂—FSCA); Humahuaca, I, Stange (1 ♀—FSCA). *La Rioja*: Angulos, XII, Porter & Stange (1 ♂—FSCA). *Cordoba*: Los Cocos, I, Stange (1 ♂, 2 ♀—FSCA); Saltos Blancos, I, Stange (1 ♂—FSCA). *Misiones*:



Cataratas del Iguazu, XI, Porter & Stange (1 ♂, 2 ♀—FSCA). BOLIVIA: *Santa Cruz*: General Saavedra, VII, Porter & Stange (1 ♀—FSCA). BRAZIL: *Santa Catalina*: Nova Teutonia, XI, Plaumann (1 ♀—KU).

***Epanthidium bertonii* (Schrottky)**

(Figs. 5, 17)

*Dianthidium bertonii* Schrottky, 1905:3. Holotype ♀, Paraguay, Puerto Bertoni, Bertoni (not located).

*Dianthidium brethesi* Schrottky, 1909a:217. Holotype ♂, Catamarca, III-08, C. Bruch (not located). **New synonymy.**

*Anthidium argentinum* Friese, 1908:72. Syntypes, ♂, ♀, Tucuman and Mendoza, XI (not located). **New synonymy.**

Taxonomy: Schrottky, 1908:230 (description ♂); Moure, 1947:35 (in *Epanthidium*).

My identifications are based on studies at Curitiba in 1974 and on the literature. There are 2 color forms; dark populations (*brethesi*) exist in the Subandean desert of Argentina, and more reddish populations occur in more humid areas. This species has no unusual features which would provide easy diagnosis.

*New records* (11 ♂, ♀).—ARGENTINA: *Catamarca*: 3 km N. Belen, XII, Porter & Stange (3 ♂—FSCA); Andalgala, J. Neff (3 ♂, 2 ♀—FSCA). *Cordoba*: Sierras, XII, Williner (1 ♀—FSCA); *Formosa*: Riacho Negro, XI, Willink (3 ♀—IML, FSCA). *La Rioja*: Carrizal, G. Bohart, XI (1 ♂—FSCA); Famatina, XII, Porter & Stange (1 ♀—FSCA). *Misiones*: San Ignacio, XII, Willink (1 ♂—FSCA). *Salta*: San Carlos, I, Monroe & Willink (1 ♂—IML). *San Luis*: Villa Dolores, II, Porter (1 ♀—FSCA). *Tucuman*: San Pedro de Colalao, I, Stange (1 ♀—FSCA); Amaicha, XI, Stange (2 ♀—FSCA, IML). BOLIVIA: *Santa Cruz*: Rio Piray, VII, Porter & Stange (1 ♂—FSCA). PARAGUAY: Villarrica, I, Schade (1 ♂—FSCA).

***Epanthidium bicoloratum* (Smith)**

(Figs. 12, 19)

*Anthidium bicoloratum* Smith, 1879:88. Holotype ♀, Mendoza (BM!).

*Anthidium bicoloratum tucumanum* Vachal, 1904:14. Holotype ♀, Tucuman, coll. Vachal (Paris). **New synonymy.**

Taxonomy: Schrottky, 1908:230 (in *Dianthidium*, description of ♂); Friese, 1908:74 (description of ♂); Moure, 1947:35 (in *Epanthidium*).

This species is easily identified in both sexes by the tegula (Fig. 19) which is drawn out posteriorly, thickened and compressed laterally.

*New records* (29 ♂, 32 ♀).—ARGENTINA: *Catamarca*: Andalgala, flowers *Prosopis alba*, X, Stange & Willink (1 ♀—IML); Belen, X, Stange (2 ♂—FSCA). *Chaco*: San Bernardo, VI, Sorio (1 ♀—Fritz Coll.). *Cordoba*: Quebrada Honda, Unquillo, I, Stange (1 ♀—FSCA); Los Cocos, I, Stange (1 ♀—FSCA). *Corrientes*: Paso de la Patria, XI, Porter (1 ♂, 3 ♀—FSCA); Santa Ana, V, Porter & Stange (1 ♀—FSCA). *La Rioja*: Famatina, XII, Porter & Stange (1 ♀—FSCA); 7 mi. S. Villa Casana, XII, Porter & Stange (1 ♀—FSCA); Santa Cruz, X, Stange (1 ♂—FSCA); Villa Union, XII, Porter & Stange (1 ♀—FSCA). *Misiones*: Posadas, XI, Porter & Stange (1 ♂—FSCA). *San Juan*: Albardon, XII, Porter & Stange (1 ♀—FSCA). *San Luis*: San Jeronimo, II, Fritz (1 ♀—Fritz Coll.). *Salta*: Yacochuya, 9 km N.W. Cafayate,

IV, Porter & Stange (2 ♂, 2 ♀—FSCA). *Santiago del Estero*: Los Tigres, I, Golbach (1 ♂—FSCA); Las Termas del Rio Hondo, IV, Porter & Stange (1 ♀—FSCA). *Tucuman*: Amaicha, XI, Stange (1 ♂—FSCA); 11 km W. Las Cejas, X, I, Stange (1 ♂, 1 ♀—FSCA); Villa Padre Moure, IV, Stange (1 ♂—FSCA).

***Epanthidium confusum* (Smith)**

(Fig. 16)

*Anthidium confusum* Smith, 1879:80. Holotype ♂, Mendoza (BM!).

*Anthidium dentiventre* Friese, 1906:100. Holotype ♀, Mendoza (Friese Coll., Berlin). Preoccupied by *Anthidium dentiventris* Friese, 1904.

*Anthidium jenseni* Friese, 1908:69. New name for *A. dentiventre* Friese, 1906.

Taxonomy: Joergensen, 1912:137 (*jenseni* = *confusum*); Moure, 1947:35 (in *Epanthidium*).

This very distinctive species occurs in the *Larrea* Subandean desert of Argentina but also in N.E. Argentina. The abruptly raised midventral carina of the thorax is distinctive in both sexes, and the abruptly raised longitudinal carina of tergum VI is distinctive in the female. The tricolored abdomen, consisting of red anteriorly and dark posteriorly, marked with large transverse pale spots is also distinctive.

*New records* (8 ♂, 15 ♀).—ARGENTINA: *Catamarca*: Ampajango, XII, Stange (1 ♂, 1 ♀—FSCA); El Pucara, Neff (1 ♀—FSCA); Cuesta de la Chilca, XII, Neff (2 ♂—FSCA). *Cordoba*: Bialeto Masse, II, Willink (1 ♀—IML); Alta Gracia, XI, Stange (1 ♀—FSCA); Quilpo, II, Fritz (1 ♀—FSCA); Capilla del Monte, II, Fritz (2 ♀—Fritz Coll.). *Corrientes*: Ituzaingo, XII, Fritz (2 ♀—Fritz Coll., FSCA). *Entre Rios*: Liebig, II, Fritz (1 ♂—Fritz Coll.). *Mendoza*: Potrerillos, II, Stange (1 ♂—FSCA). *Salta*: Yacochuya, 9 mi. N.W. Cafayate, X, XII, Porter & Stange (1 ♂, 2 ♀—FSCA). *Tucuman*: Amaicha, XI, Stange (1 ♂—FSCA).

***Epanthidium erythrocephalum* (Schrottky)**

(Figs. 13, 21)

*Anthidium erythrocephala* Schrottky, 1903:453, Pl. XIII, Fig. 8. Syntypes, ♂, ♀, Campinas, São Paulo (São Paulo).

Taxonomy: Schrottky, 1910:271 (in *Dianthidium*); Moure, 1947:35 (in *Epanthidium*).

Both sexes are distinguished by the angled axilla (Fig. 21). The lack of a longitudinal carina on tergum VI of the female is shared only by *E. boharti* and *E. paraguayense*. Schrottky (1903) gave a color figure of this species which has distinctive coloration among the known Brazilian species.

*New records* (14 ♂, 9 ♀).—ARGENTINA: *Misiones*: Bompland, III, Joergensen (1 ♂—La Plata); Cataratas del Iguazu, XI, Porter & Stange (1 ♀—FSCA). *Salta*: Rio Pescado, YPF Estacion, XI, Porter (1 ♂—FSCA); Yacochuya, 9 km N.W. Cafayate, XII, IV, Porter & Stange (2 ♂, 1 ♀—FSCA). *San Juan*: Pocitos, I (1 ♂—FSCA). *Tucuman*: Horco Molle, 700 m, II, Stange (1 ♂—FSCA); Tacanas, XII, Stange (1 ♀—FSCA). BOLIVIA: *Santa Cruz*: Saavedra, Est. Experimental, I, Stange (1 ♀—FSCA); 38 km N. Santa Cruz, I, Stange (1 ♀—FSCA); Buena Vista, VII, Stange (2 ♂—FSCA). BRAZIL: *Goiás*: Aragarcas, I, Oliviera (1 ♀—FSCA). PARAGUAY: Rio Ypone, Cororo, II, Fritz (5 ♂, 4 ♀—FSCA, Fritz Coll.).

***Epanthidium joergenseni* (Friese)**

(Figs. 3, 15)

*Anthidium joergenseni* Friese, 1908:73. Syntypes, ♂, ♀, Mendoza (Pedregal) and Tucuman, Argentina (not located).

*Dianthidium bruchi* Schrottky, 1909a:217. Holotype ♂, Catamarca, Argentina, C. Bruch, III-08 (not located). **New synonymy.**

Taxonomy: Joergensen, 1912:137 (in *Dianthidium*); Moure, 1947:35 (in *Epanthidium*).

This is one of the largest species in the genus, apparently confined to the *Larrea* Subandean desert in Argentina. The female has a characteristic subapical ridge on sternum VI with a strongly developed lateral process much anterior to the large apical process (Fig. 15), the 3 processes forming an almost equilateral triangle. The male is less easily characterized but lacks reddish bristles on sternum II and III, has tergum VII with the emargination between the middle and lateral processes rather narrow (Fig. 3), and lacks specializations found in other species (axilla not modified, midventral carina of thorax not raised, tegula neither drawn out nor impunctate). I am synonymizing *Dianthidium bruchi* Schrottky based on the original description.

*New records* (10 ♂, 9 ♀).—ARGENTINA: *Catamarca*: Andalgala, X, I, flowers of *Verbecina*, Neff, Stange & Willink (4 ♂, 1 ♀—FSCA, IML); Ampajango, XII, Stange (1 ♀—FSCA); Los Nacimientos de Abajo, I, III, Stange & Willink (1 ♂, 1 ♀—FSCA, IML). *Salta*: Yacochuya, 9 km N.W. Cafayate, IX, Stange & Willink (1 ♂, 1 ♀—FSCA, IML); Tacuil, XII, Stange & Willink (1 ♂—IML). *Santiago del Estero*: Rio Salado, Wagner (1 ♀—La Plata). *Tucuman*: Amaicha, XI, Stange (3 ♂, 1 ♀—FSCA).

***Epanthidium nectarinioides* (Schrottky)**

(Fig. 22)

*Anthidium nectarinioides* Schrottky, 1903:451. Syntypes, ♂, ♀, Campinas, São Paulo, Brazil, 30-I (São Paulo).

Taxonomy: Schrottky, 1910:271 (in *Dianthidium*); Schwarz, 1933:21 (in *Anthodioctes*); Moure, 1947:35 (in *Epanthidium*).

This species is easily recognized by the color pattern. The black body with metasomal terga III–VI yellowish orange is unique in the genus. However, this pattern is common in *Anthodioctes* (Megachilidae) and *Brachygastra* (Vespidae) and other Hymenoptera of the same region. In the original description, this name is spelled “*nectarinioides*” but this is obviously a typographical error since the name is spelled “*nectarinioides*” in two other places (pp. 444, 445 in Keys). The spelling “*nectarinioides*” has been used in all subsequent citations.

*New records* (5 ♂, 4 ♀).—ARGENTINA: *Jujuy*: Camino St. Pedro, II, Monroe & Willink (1 ♂—IML). *Misiones*: I (1 ♂—La Plata). *Salta*: Pocitos, XI, IV, Porter & Fritz (2 ♂, 2 ♀—FSCA, Fritz Coll.); Rio Pescado, YPF Estacion, IV, Porter (1 ♂, 1 ♀—FSCA).

***Epanthidium nigrescens* Friese, NEW COMBINATION**

(Fig. 18)

*Anthidium nigrescens* Friese, 1906:100. Syntypes, ♂, ♀, Mendoza, Salta (AMNH!; Berlin).

The male is distinguished by the combination of reddish bristles mesad of sublateral tooth of transverse ridge of sternum II, densely punctate unmodified tegula and raised ventral median longitudinal carina of mesothorax. The lack of a definite sublateral spine-like process (Fig. 18) on female sternum VI is distinctive. Also, the weak longitudinal carina of tergum VI is a helpful character to identify the females. A nest was seen from Bolivia with 5 cells (no resin) in adobe clay attached beneath a rock overhang.

*New records* (41 ♂, 38 ♀).—ARGENTINA: *Jujuy*: Palpala, I, Aczel (2 ♂—IML); 6 km S. Volcan, III, Stange & Willink (1 ♀—FSCA). *Mendoza*: Mendoza, I (1 ♂—FSCA). *Salta*: Yacochuya, 9 km N.W. Cafayate, IV, Porter & Stange (32 ♂, 30 ♀—IML, FSCA, LACM); Tacuil, IV, Stange & Willink (2 ♂, 2 ♀—IML, FSCA). *Tucuman*: Amaicha, XI, I, Stange (3 ♂, 1 ♀—FSCA). BOLIVIA: Camargo, 2480 m, I, Weyrauch (2 ♂—IML, FSCA).

***Epanthidium paraguayense* (Schrottky)**

(Fig. 4)

*Dianthidium paraguayense* Schrottky, 1908:232. Holotype ♀, Paraguay, Asuncion, Anisits leg., 4-I (not located).

Taxonomy: Moure, 1947:35 (in *Epanthidium*).

The male has a bilobate tergum VII which is distinctive except for *E. boharti*. The female lacks a longitudinal carina on tergum VI which is also characteristic for *E. boharti* and *E. erythrocephalum*. The tricolor pattern of *E. paraguayense* distinguishes both sexes from *E. boharti*, whereas the non-angled axilla provides an easy recognition character from *E. erythrocephalum*. All of the previous records were from N.E. Argentina, Paraguay and S.E. Brazil so that the newly collected material from N.W. Argentina is an important range extension.

*New records* (33 ♂, 30 ♀).—ARGENTINA: *Salta*: Yacochuya, 9 km N.W. Cafayate, IV, Porter & Stange (29 ♂, 24 ♀—FSCA, LACM, Fritz Coll.); Pocitos, XI, Fritz (1 ♀—FSCA). *Catamarca*: El Rodeo, IV, Porter (2 ♂—FSCA). *Misiones*: Bompland, I, Joergensen (1 ♂—La Plata); Dos de Mayo, XI, Escobar & Claps (1 ♀—IML). *Tucuman*: 10 km W. Las Cejas, IV, Stange (1 ♂—FSCA). BRAZIL: Xambore, XII, Azeveda (1 ♀—Curitiba); Matto Grosso, IV–V, Fairchild (1 ♀—FSCA). PARAGUAY: Independencia, II, J. Foerster (1 ♀—KU); Rio Ypane, Cororo, II, Fritz (1 ♀—Fritz Coll.).

***Epanthidium sanguineum* (Fries)**

(Fig. 10)

*Anthidium sanguineum* Fries, 1908:74. Syntypes, ♂, ♀, Mendoza & Tucuman (Vienna!).

Taxonomy: Joergensen, 1912:138 (in *Dianthidium*); Moure, 1947:35 (in *Epanthidium*).

This species is distinguished easily from all other known *Epanthidium* by the nearly impunctate tegula. The apically bispined subapical ridge of sternum VI of the female is diagnostic for that sex. In the male the toothed midcoxa is characteristic. Coloration is highly variable with the metasoma reddish in terga I–II, and III–VI much darker with or without pale areas on the terga. It is fairly abundant in the Subandean desert of western Argentina.

*New records* (25 ♂, 24 ♀).—ARGENTINA: *Catamarca*: 8 mi. N. Belen, flowers of *Zuccagnia*, X, Stange (3 ♂, 1 ♀—FSCA); Andalgalá, flowers of *Prosopis alba*, X, Willink & Stange (1 ♂—IML); 6 km S. Santa Maria, flowers of *Larrea divaricata*, XII, Willink & Stange (1 ♀—IML); Ampajango, XII, Stange (1 ♀—FSCA). *La Pampa*: Sierra Lihuel Calel, II, Stange (1 ♀—FSCA). *La Rioja*: 7 km S. Villa Casana, flowers of *L. divaricata*, XII, Porter & Stange (1 ♂, 5 ♀—FSCA); Villa Union, XII, Porter & Stange (1 ♀—FSCA). *Mendoza*: La Pasarella, flowers of *L. divaricata*, XI, Neff (1 ♂—FSCA). *Rio Negro*: Balneario Las Grutas, I, J. & L. Stange (1 ♀—FSCA). *Salta*: Yacochuya, 9 km N.W. Cafayate, XII, Porter & Stange (1 ♀—FSCA). *Tucuman*: Amaicha, XI, I, Stange (3 ♂, 2 ♀—FSCA).

***Epanthidium tigrinum* (Schrottky)**

(Fig. 14)

*Hypanthidium tigrinum* Schrottky, 1905:10. Holotype ♀, Paraguay, Villa Encarnacion (Vienna!).

*Anthidium multifasciatum* Strand, 1910:547. Syntypes, 4 ♂, Paraguay, Villa Morro and Asuncion (Berlin). **New synonymy.**

Taxonomy: Schrottky, 1908:231 (in *Dianthidium*; description of ♂); Moure, 1947:33 (type species of *Epanthidium*).

The male of this species is unique in the genus in having reddish bristles on metasomal sternum III and by the small process of the mesepisternum. The female is distinguished easily by the mostly yellow mandibles. The typical pale stripes on the mesoscutum do not vary in my specimens, but occur in some other species.

*New records* (14 ♂, 13 ♀).—ARGENTINA: *Misiones*: Cataratas del Iguazu, XI, C. Porter & L. Stange (13 ♂, 9 ♀—FSCA, UCD, LACM). PARAGUAY: Villa Encarnacion (2 ♀—Vienna, LACM); Villarrica, II, F. H. Schade (1 ♀—KU). BRAZIL: *Goiás*: Ihla do Bananal, Santa Isabel do Moro, VI, M. Alvarenga (KU); *Minas Gerais*: Belo Horizonte (1 ♀—Curitiba). BOLIVIA: *Santa Cruz*: Buena Vista, I, Porter & Stange (1 ♂—FSCA).

FLORAL RECORDS

All floral records are from Argentina, mostly from Andalgalá, Prov. Catamarca, October 1973 to March 1974 by J. L. Neff, unless otherwise noted.

ACANTHACEAE

*Justicia campestris* Griseb.

BORAGINACEAE

*Heliotropium* sp.

CAPPARIDACEAE

*Atamasquea emarginata* Miers ex Hook. & Arn.

COMPOSITAE

*Hyalis argentea* D. Don ex Hook. & Arn.

*Senecio* sp.

EPANTHIDIUM spp.

*confusum* (1 ♂, 1 ♀, Cuesta de Chilca, Catamarca)

*bicoloratum* (1 ♂, Fuerte Quemada, Tucuman, I, Neff)

*sanguineum* (4 ♂, 3 ♀, III)

*joergenseni* (1 ♂, XII)

*bertonii* (1 ♂, Belen, Catamarca, XII, Neff)

*bicoloratum* (Joergensen, 1912)



*Tessaria dodonaefolia* Cabrera

*T. absinthioides* (Hook. & Arn.) DC

*Wedelia glauca* (Ortega) Blake

*Verbesina octantha* S. F. Blake

*Verbesina* sp.

#### EUPHORBIACEAE

*Jatropha excisa* Griseb.

#### LABIATAE

*Salvia gilliesii* Benth.

#### LEGUMINOSAE

*Hoffmanseggia* sp.

*Marrubium vulgare* L.

*Prosopis chilensis* (Mol.) Stuntz

*P. nigra* (Griseb.) Hieron.

*P. alba* Griseb.

*Adesmia muricata* (Jacq.) A. DC

*Adesmia* sp.

*Zuccagnia punctata* Cav.

*Cercidium praecox* (R. & P. Harms.)

#### LOASACEAE

*Caliphora* sp.

*bertonii* (1 ♂, Andalgala, X, Bohart; 1 ♂, Belen, Catamarca, XII, Neff)

*bicoloratum* (1 ♀)

*joergenseni* (1 ♂, Chaquiago, Catamarca, XII, Neff)

*bicoloratum* (1 ♀)

*bicoloratum* (6 ♂, 2 ♀, Andalgala, XI, Bohart)

*joergenseni* (7 ♂, 1 ♀, Andalgala, X, Stange)

*sanguineum* (2 ♂, XII)

*bicoloratum* (1 ♂)

*paraguayense* (1 ♂, Yacochuya, Salta, IV, Stange)

*confusum* (after Joergensen, 1912)

*joergenseni* (after Joergensen, 1912)

*bicoloratum* (2 ♀, Yacochuya, XII, Stange)

*bertonii* (2 ♀, Yacochuya, XII, Stange; 1 ♂, Salta, XII, Neff)

*autumnale* (1 ♀, Yacochuya, Salta, XII, Neff)

*erythrocephalum* (1 ♂, Yacochuya, XII, Stange)

*joergenseni* (2 ♂)

*sanguineum* (1 ♂)

*bicoloratum* (13 ♂, 4 ♀)

*sanguineum* (1 ♂, 1 ♀, Colpes, Catamarca)

*bertonii* (2 ♂, Carrizal, La Rioja, X, Bohart)

*bicoloratum* (5 ♂, 1 ♀, Andalgala, XI, Bohart)

*confusum* (1 ♀, Yacochuya, XII, Stange)

*autumnale* (1 ♂, Yacochuya, Salta, Stange)

*bicoloratum* (1 ♀)

*bicoloratum* (1 ♂)

*confusum* (Joergensen, 1912)

*joergenseni* (1 ♀, Yacochuya, Salta, XII, Stange)

*nigrescens* (1 ♀, Yacochuya, Salta, XII, Stange)

*bertonii* (1 ♀, Escoipe, Salta, II, Neff)

OXALIDAE

*Oxalis* sp. *confusum* (1 ♀, Agua de las Palomas, Catamarca, I, Neff)

POLYGALACEAE

*Monnina lorenziana* Chod. *sanguineum* (1 ♀, III)  
*bicoloratum* (1 ♂)

SOLANACEAE

*Salpichroa organifolia* (Lam.) Thel- *bicoloratum* (2 ♂, 1 ♀)  
lung  
*Lycium chilense* Miers ex Bert. *bicoloratum* (1 ♀, Los Cocos, Cordoba, I, Stange)  
*autumnale* (1 ♂, 1 ♀, Los Cocos, Cordoba, I, Stange)

VERBENACEAE

*Lippia turbinata* Griseb. *bicoloratum* (7 ♂, 1 ♀)

ZYGOPHYLLACEAE

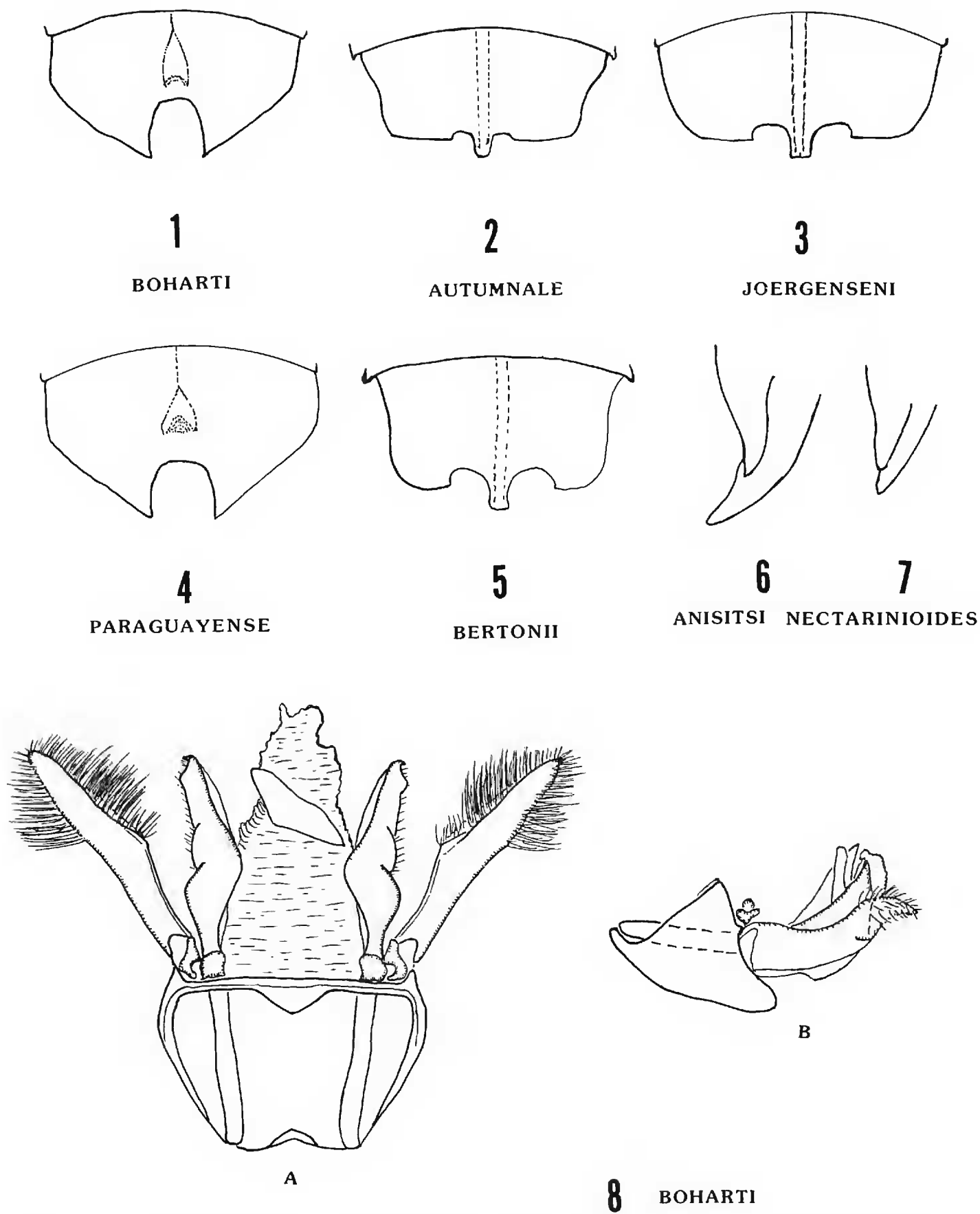
*Bulnesia foliosa* Griseb. *bertonii* (1 ♂, Tapia, Tucuman, II, Neff)  
*Larrea cuneifolia* Cav. *sanguineum* (3 ♂, 3 ♀, XII)  
*bicoloratum* (3 ♂)  
*sanguineum* (2 ♂, XII; 1 ♂, XI, La Pasarella, Mendoza, Neff)  
*bicoloratum* (2 ♂, Cebollar, La Rioja, XI, Bohart)  
*joergenseni* (1 ♂, Andalgala, XI, Bohart)  
*bertonii* (1 ♂, Andalgala, X, Bohart)

*L. divaricata* Cav.

KEY TO SPECIES OF *EPANTHIDIUM* MOURE

Males

- 1. Seventh metasomal tergum bilobate (Figs. 1, 4); curved ridge of sternum II ending laterally in blunt process, without associated reddish bristles; height of opaque lamella of posterior lobe of pronotum less than mid-ocellus diameter ..... 2
- Seventh tergum trilobate (Figs. 2, 3, 5); curved ridge of sternum II usually ending laterally in sharp tooth, sometimes with reddish bristles mesad to tooth or on sternum III; height of translucent lamella of posterior lobe of pronotum usually more than midocellus diameter (except *E. nectarinioides* ..... 3
- 2. Black with ivory markings on head, pronotum, axillae, metanotum, and some metasomal terga; emargination of tergum VII deeper than width at apex (Fig. 1) (Mexico) ..... *boharti* Stange, n. sp.
- Black and yellow, with orange on vertex, metanotum, tegula and legs; emargination of tergum VII about equal to width at apex (Fig. 14) (Argentina, Brazil, Paraguay) ..... *paraguayense* (Schrottky)
- 3. Metasomal sternum II or III with prominent, usually dark reddish bristles mesad of tooth or lateral angle ..... 4
- Metasomal sternum II and III without bristles ..... 6
- 4. Metasomal sternum II with only 1 or 2 prominent bristles mesad of



Figs. 1-8. *Epanthidium* spp. 1-5, Male tergum VII, dorsal view. 6, 7, Side view of tergum VII. 8, Male genitalia (a = ventral view, b = lateral view).

tooth but III with many bristles; mesepisternum with small tooth posterior to extreme ventral part of preepisternal carina; ventral median longitudinal carina of mesosoma low throughout; tegula with many fine punctures (Misiones, Argentina; Bolivia; Brazil; Paraguay) ..... *tigrinum* (Schrottky)

- Metasomal sternum II with more prominent, usually dark red bristles mesad of tooth than on sternum III; mesepisternum without small tooth

- ventrally; ventral median longitudinal carina of mesosoma produced toothlike near anterior margin, or midcoxa with tooth at mesal posterior angle; tegula punctate or nearly impunctate ..... 5
5. Ventral median longitudinal carina of mesosoma low throughout its course; reddish bristles on sternum II running nearly to midline; tegula nearly impunctate; midcoxa produced toothlike at mesal posterior angle (Subandean desert, Argentina) ..... *sanguineum* (Friese)
- Ventral median longitudinal carina of mesosoma produced toothlike near anterior margin; reddish bristles end well before midline; tegula with many fine punctures; midcoxa without tooth at mesal posterior angle (Subandean desert, Argentina—dark form; Chaco, Argentina; Bolivia—reddish form) ..... *nigrescens* (Friese)
6. Tegula drawn out posteriorly and thickened dorso-ventrally (Fig. 19); midcoxa with small tooth or angle at mesal posterior angle ..... *bicoloratum* (Smith)
- Tegula not drawn out and thickened posteriorly (Fig. 20); midcoxa without process at mesal posterior margin ..... 7
7. Midventral carina of mesosoma produced toothlike near anterior margin (Subandean desert, Argentina) ..... *confusum* (Smith)
- Midventral carina of mesosoma not produced toothlike ..... 8
8. Tergum VII with lateral lobe nearly continuous with median process (Fig. 2) (Subandean desert, Chaco or Misiones, Argentina) ..... *autumnale* (Schrottky)
- Tergum VII with deep U-shaped emargination separating lateral lobe from median process (Figs. 3, 5) ..... 9
9. Upper row of propodeal pits strongly developed for nearly complete distance; axilla angled or metasoma with anterior terga dark and posterior terga orange ..... 10
- Upper row of propodeal pits weakly developed, fading toward middle; axilla not angled; metasoma without contrasting dark and orange terga ..... 11
10. Metasoma with terga I–II dark, III–VI orange; axilla not angled (Fig. 22) (N.W. Argentina, Bolivia, Brazil, Paraguay) .. *nectarinoides* (Schrottky)
- Metasoma with all terga dark with yellow spots or transverse stripes; axilla angled (Fig. 21) (N. Argentina, Bolivia, S.E. Brazil, Paraguay) .. *erythrocephalum* (Schrottky)
11. Tergum VII with middle process projecting below plane of lateral process (Fig. 6); tooth at lateral margin of transverse ridge of metasomal sternum II very large (basal width about equal to basal width of hind basitarsomere), elevated at about a 40° angle from surface (Paraguay) ..... *anisitsi* (Schrottky)
- Tergum VII with middle process on same plane as lateral process (Fig. 7); tooth of transverse ridge of sternum II small, only slightly raised from surface ..... 12
12. Lateral margins of terga V–VI with toothlike projections; tergum VII with width of lateral process less than 2 times that of emargination between middle and lateral processes (Fig. 5) (N. Argentina, Bolivia) ..... *bertonii* (Schrottky)

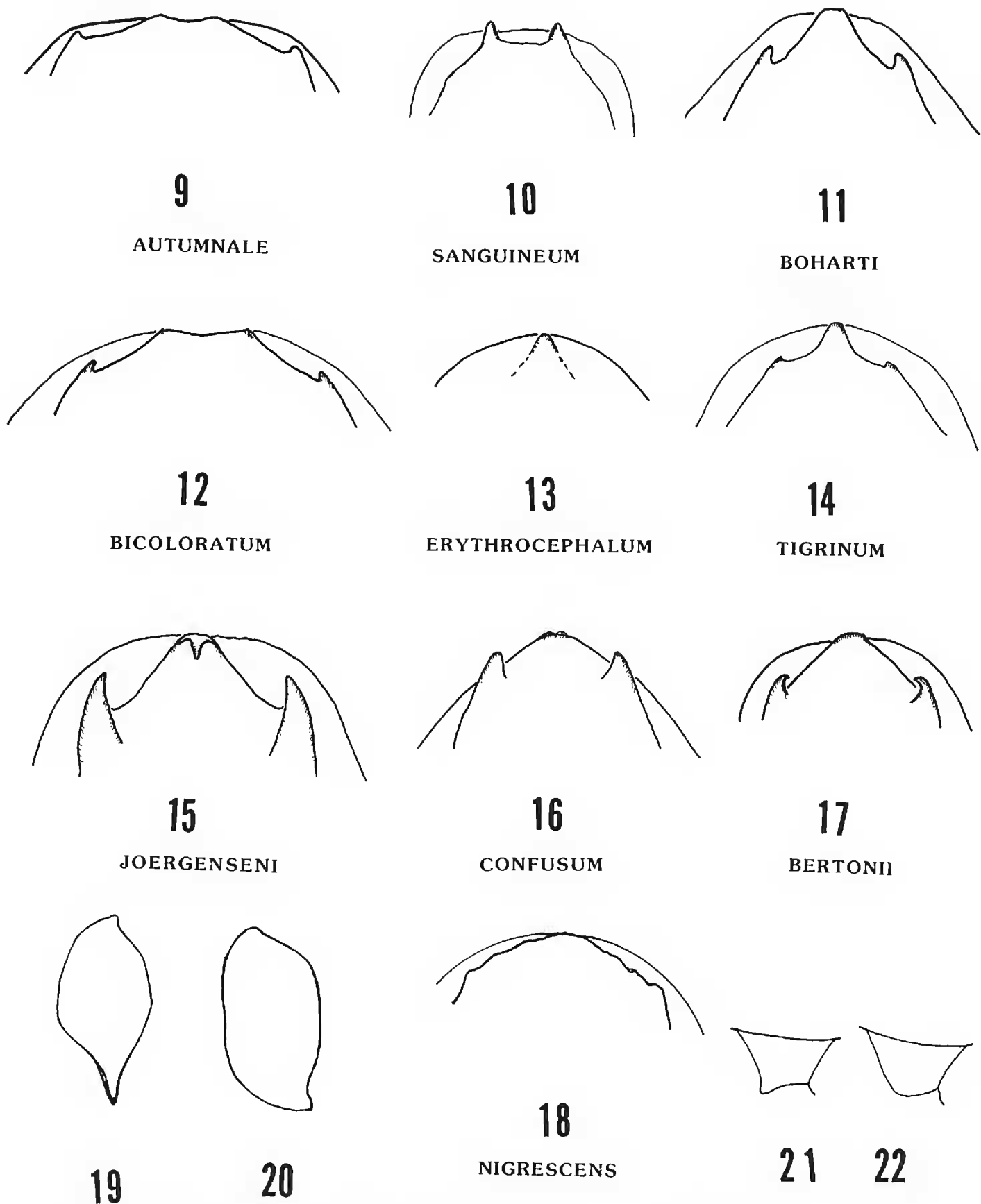
- Lateral margins of terga V–VI tuberculate; tergum VII with width of lateral process more than 2 times that of emargination between middle and lateral process (Fig. 3) (Subandean desert, Argentina) ..... *joergenseni* (Frieese)

Females

(Female of *E. anisitsi* unknown)

1. Tergum VI without longitudinal carina; mandible mostly dark; clypeus without continuous impunctate raised band along midline, although some impunctate areas may be present ..... 2
- Tergum VI with longitudinal carina for at least half the distance between anterior margin and sting emargination, if weak or obscure (some *tigrinum* and *nigrescens*), mandible mostly yellow or clypeus with strong impunctate raised band on midline from apex to dorsal border ..... 4
2. Axilla strongly angled laterally (Fig. 21); sternum VI with subapical ridge not produced into a prominent tooth sublaterally (Fig. 13); tergum VI with sublateral band produced into spine laterally followed by small series of teeth (best seen in ventral view); height of translucent lamella of pronotal lobe more than midocellus diameter (N. Argentina, Bolivia, S.E. Brazil) ..... *erythrocephalum* (Schrottky)
- Axilla rounded laterally (Fig. 22); sternum VI with subapical ridge produced into a prominent tooth sublaterally (Fig. 11); tergum VI with lateral angle of sublateral band rounded followed by a rounded lobe; height of opaque pronotal lobe less than midocellus diameter ..... 3
3. Black with ivory markings; terga III–VI with transverse ivory band at middle, black laterally; distance from lateral ocellus to posterior margin much greater than interocellar distance, area below midocellus with punctures about a puncture diameter apart (N.E. Mexico) ..... *boharti* Stange, n. sp.
- Black and yellow, with orange on vertex, metanotum, tegula and legs; terga III–VI dark at middle with sublateral pale band; distance from lateral ocellus to posterior margin about equal to or less than interocellar distance, sculpture about the same as area below midocellus (Salta and Misiones, Argentina; S.E. Brazil; Paraguay) ..... *paraguayense* (Schrottky)
4. Tegula drawn out posteriorly into a laterally compressed process (Fig. 19) (Argentina) ..... *bicoloratum* (Smith)
- Tegula not drawn out posteriorly (Fig. 20) ..... 5
5. Tegula nearly impunctate; subapical ridge of sternum VI with pair of submedium spines at posterior middle (Fig. 10) (Argentina deserts) ..... *sanguineum* (Frieese)
- Tegula with many fine punctures; subapical ridge of sternum VI without pair of spines ..... 6
6. Mandible predominately yellow; tergum VI with longitudinal carina weak, sometimes obliterated (N.E. Argentina, Bolivia, S.E. Brazil, Paraguay) ..... *tigrinum* (Schrottky)
- Mandible predominately dark (some *bertonii* have yellowish mandibles but carina of tergum VI strongly developed) ..... 7





Figs. 9-22. *Epanthidium* spp. 9-18, Female sternum VI in ventral view. 19, 20, dorsal view of tegula; 19, *E. bicoloratum*, 20, *E. autumnale*. 21, 22, Dorsal view of axilla; 21, *E. erythrocephalum*, 22, *E. nectarinioides*.

- 7. Body and terga I-II black, terga III-VII mostly orange (N. Argentina, S.E. Brazil) ..... *nectarinioides* (Schrottky)
- Without this color combination, terga I-II with pale spots or transverse stripes or mostly reddish ..... 8
- 8. Midventral carina of thorax raised abruptly at anterior margin; longitudinal carina of tergum VI abruptly raised near middle; terga I-II mostly

- reddish and terga III–V dark with large pale-yellow transverse stripes (Subandean desert, Argentina) ..... *confusum* (Smith)
- Midventral carina of thorax not raised; longitudinal carina of tergum VI not abruptly raised near middle; different color combination on abdominal ridge ..... 9
9. Metasomal sternum VI with subapical ridge strongly produced laterally and with a truncate (Fig. 17) or spine-like median process (Fig. 15); longitudinal carina of tergum VI strong to posterior margin ..... 10
- Metasomal sternum VI with subapical ridge usually angled at most laterally, when somewhat produced process not much larger than lateral angle of tergum VI (Figs. 12, 18), without discrete median process; longitudinal carina of tergum VI not reaching posterior margin or weaker than impunctate raised area on clypeus ..... 11
10. Metasomal sternum VI with subapical ridge produced spine-like at middle (Fig. 15); lateral angle of tergum V weakly developed, much smaller than lateral angle of tergum VI (Subandean desert, Argentina) ..... *joergenseni* (Friese)
- Metasomal sternum VI with subapical ridge truncate at middle (Fig. 17); lateral angle of tergum V strongly developed, often as large as lateral angle of tergum VI ..... *bertonii* (Schrottky)
11. Median impunctate raised band on clypeus more strongly developed than median longitudinal carina of tergum VI (which is usually strongest near posterior margin) (N.W. Argentina) ..... *nigrescens* (Friese)
- Median impunctate raised band on clypeus less developed than median carina of tergum VI (which fades toward posterior margin) (N. Argentina, S.E. Brazil) ..... *autumnale* (Schrottky)

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